

# 'Cool suit'

*helps beat the heat*



*by Esther McNeal  
for the Star*

Imagine working in hot weather with protective clothing that traps body heat like a plastic bag. Add a respirator, and the situation can be almost unbearable.

Some workers at the Idaho National Engineering and Environmental have to work in such difficult conditions. In some situations, they must take "cool-down" breaks that last at least as long as they've been working. This makes the process unproductive, and the workers are still uncomfortable while on the job.

But a solution has been found for this situation.

D&D Operations and the Accelerated Site Technology Deployment Integrated Decontamination and Decommissioning project



Relief is in sight for workers who must wear protective clothing in uncomfortably warm situations: a new device that circulates cold water to cool the body.

recently tested and used Personal Ice Cooling System suits, which are manufactured by Delta Temax Inc.

According to those involved in recent decontamination and decommissioning work, the Personal Ice Cooling System is a huge asset.

“It made us a lot more comfortable,” says Brenda Gonzales, an INEEL worker who recently used the suit at the Test Area North Process Experimental Pilot Plant facility. “It kept our body temperatures normal.”

The heart of the system is a suit — similar to long underwear — with tubes sewn into it that circulate cold water past the worker's skin. The suit is worn under any necessary personal protective clothing.

In addition to the suit, the system consists of a pump, a two-liter ice bottle carried in a pouch, and a control system so the worker controls the rate of cooling.

The suit, made of flame resistant material, is available with pants, a shirt or vest, and a hood. It comes equipped with a tough, insulated pouch attached to a harness that can be worn on the back,

chest or waist.

Previous tests showed that cooling the wearer's torso is most effective and that workers preferred using only the vest or shirt. So the INEEL purchased vests and shirts rather than the full suit.

The ice bottles in the pouch are made of high-density polyethylene. They can be filled with ice cubes or frozen solid in a standard freezer, and are easily stored in a freezer or ice chest.

Cool water flows from the ice bottles through the flexible tubing. As the water flows, it absorbs body heat — keeping the wearer cool.

Normally, one ice bottle provides about two hours of cooling. However, INEEL workers found a way to change the ice bottles without having to change out of all their PPE when working in areas with low contamination levels. They cut a slit in the PPE, insert a new ice bottle, and then tape the slit closed.

The user can adjust the cooling rate based on work load and temperature conditions using a two-speed flow control. The suit is

portable, easy to use, and totally self-contained.

The vest with the pump and two liters of water weighs only about 12 pounds.

April Summers, another INEEL worker who's used the cooling suits, said it's worth the added weight. "It works really good," she says. "We're thankful to have them."

The cooling suits have been used at the INEEL since late June 1999. They were first used at TAN's PREPP facility.

Workers removing hazardous heavy metals like lead, arsenic and mercury were wearing full personal protective equipment in hot temperatures and decided to try the suits. They noticed an immediate difference and felt more comfortable while working.

The workers took fewer cool-down breaks and were allowed to stay in the work area for twice the time they normally would have, under oversight by an industrial hygienist.

Everyone who used the suits likes them and wants to continue using them. "I highly recommend these suits to other workers," says

Gonzales.

The cooling suits have been used recently at the Test Reactor Area, where workers are performing maintenance on the Advanced Test Reactor. The radiological engineer, John Miller, had seen the suits in use at Rocky Flats, and was pleased to find that some of the suits were already available at the INEEL.

The project goal of the Accelerated Site Technology Deployment Integrated Decontamination and Decommissioning Project is to find technologies that provide a better way of doing things and implement them into the work site. With support from the D&D Operations team, seven new D&D technologies were used at the INEEL in Fiscal Year 99.

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